PROPOSED PLAN
HIMCO DUMP SUPERFUND SITE
Elkhart, Indiana
September 1992

INTRODUCTION AND PURPOSE

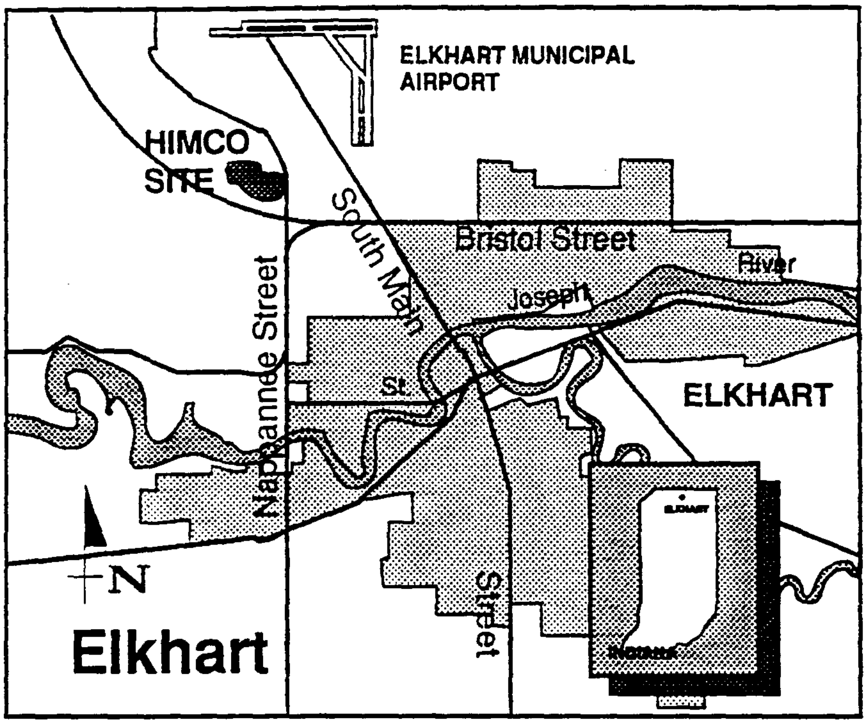
The U.S. Environmental Protection Agency (U.S. EPA or The Agency), in consultation with the Indiana Department of Environmental Management (IDEM), is proposing a remedial action to address the contamination at the Himco Dump (Himco) Superfund Site in Elkhart, Indiana (Figure 1). The Remedial Investigation/Feasibility Study (RI/FS) has recently been completed. The Remedial Investigation (RI) evaluated contamination of soils, landfill gas, landfill leachate, surface water, sediments, and groundwater at the site, and estimated the risks posed by the site to human health and the environment. The Feasibility Study (FS) identified cleanup alternatives for the site.

U.S. EPA is issuing this Proposed Plan as part of its public participation responsibilities under Section 117(a) of the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA). Section 117(a) requires U.S. EPA to publish a Proposed Plan for remedial action for each Superfund site and to make it available for public review. In general, the Proposed Plan will: (1) provide background information on the site; (2) describe the alternatives considered for the site; (3) present the rationale for identification of a preferred alternative for the site; and (4) outline the public's role in the selection of a site remedy.

This Proposed Plan is issued to provide citizens with the information used by the Agency to develop the alternatives for the Himco Dump Superfund site in Elkhart, Indiana. This Plan summarizes the alternatives that the U.S. EPA has considered for the site cleanup and presents and evaluates U.S. EPA's preferred alternative.

This Proposed Plan identifies U.S. EPA's preferred alternative as Alternative 4: Containment by Means of a Composite Barrier, Solid Waste Cap; Active Collection and Treatment of Landfill Gas; Groundwater Monitoring; and Institutional Controls. The alternatives summarized in this Proposed Plan are described in the FS. The FS as well as the RI and any other pertinent documents located in the administrative record should be consulted for further details on the development and evaluation of the alternatives considered.

FIGURE 1



ELKHART MUNICIPAL
AIRPORT
HIMCO
SITE
South Main
Bristol Street
River
Joseph
Nappanee Street
St.
ELKHART
N
Street
Elkhart

Public input on the Himco Dump site is an important contribution to the remedy selection process. Interested citizens can submit written comments to U.S. EPA during a 30-day public comment period, extending from September 30, 1992 through October 29, 1992.

U.S. EPA, in consultation with IDEM, will consider all significant comments made during the public comment period before making a determination on the cleanup remedy. Based on new information or public comments, U.S. EPA, after consultation with IDEM, may modify the preferred alternative or select another option presented in this proposed plan or the FS report. Therefore, the public is encouraged to review and comment on <u>all</u> cleanup alternatives identified in this proposed plan.

SITE BACKGROUND

<u>SITE LOCATION AND DESCRIPTION</u>

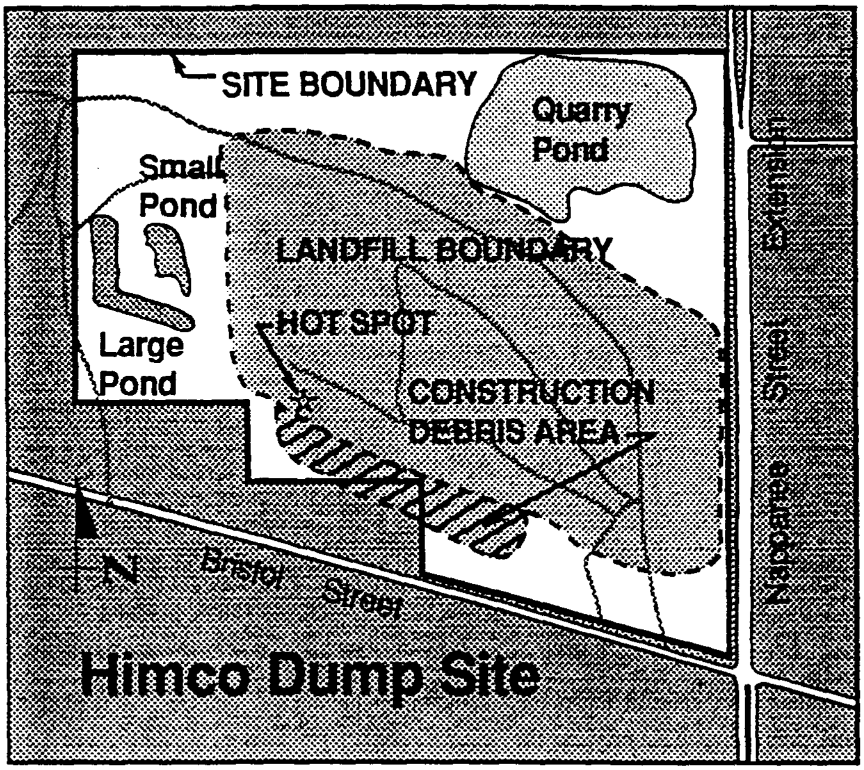
The Himco Dump site is a closed landfill located at County Road 10 and the Nappanee Street Extension in Cleveland Township, adjacent to the City of Elkhart, Elkhart County, Indiana. The site is located approximately two miles north of the St. Joseph River which runs east-west through the City of Elkhart. The site covers approximately 50 acres and is bounded on the north by a tree line and a gravel pit pond; on the west by two ponds (an L shapped pond called the "L" pond, and the small pond); on the south by County Road 10 and private residences; and on the east by Nappanee Street Extension. See Figure 1.

The approximate boundaries of the landfill within the site are shown in Figure 2. The landfill area is covered with a layer of sand, under which is a layer of white, powdery, calcium sulfate. The western half of the landfill cover is vegetated with grasses; the eastern half with grasses, bushes, and young trees. An area south of the landfill and north of County Road 10, the construction debris area, contains many small piles of rubble, concrete, asphalt, and metal debris.

There is an abandoned gravel pit operation in the northeast corner of the site. An old truck scale and concrete structures are also present in this area. The gravel pit is filled with water which is approximately 30 feet deep. Two smaller and shallower ponds, the L pond and the small pond, are on the west side of the site. See Figure 2.

The site is not fenced. In the vicinity of the site are agricultural, residential, and light industrial land uses. There is an access road which leads from the southeast corner of the site near the intersection of County Road 10 and Nappanee Street

FIGURE 2



SITE BOUNDARY
Quarry Pond
Small Pond
LANDFILL BOUNDARY
HOT SPOT
Large Pond
CONSTRUCTION DEBRIS AREA
N
Bristol Street
Nappanee Street Extension
Himco Dump Site

Extension. A locked gate is present across this road; however, vehicles can easily drive around the gate and enter the site.

HISTORY OF SITE ACTIVITIES AND ENFORCEMENT

The Himco site was privately operated by Himco Waste Away Service, Inc., and was in operation between 1960 and September 1976. As of January 1990, the parcels of land which comprise the landfill are owned by the following individuals or corporations: Miles Laboratories; CLD Corporation; Alonzo Craft, Jr.; and Indiana and Michigan Electric Company.

In 1971, the Indiana State Board of Health (ISBH) first identified the Himco site as an open dump. In early 1974, residents along County Road 10 south of the Himco site complained to ISBH about color, taste, and odor problems with their shallow wells. Analyses of six shallow wells along County Road 10, ranging in depth from 20 to 30 feet, showed high levels of manganese. Mr. Chuck Himes, the principal landfill operator, replaced these wells with deeper wells ranging in depth from 152 to 172 feet below ground surface. By mid 1990, the wells showed high concentrations of sodium which posed a chronic health threat to the residents. By November 1990, municipal water service was provided to those residents whose wells were affected and was financed by Miles Laboratories, Inc. and Himco Waste Service, Inc.

In 1976, the landfill was closed and covered with approximately one foot of sand overlying a calcium sulfate layer.

In 1984, a U.S. EPA field investigation team conducted a site inspection. Analyses from monitoring wells showed that the groundwater downgradient of the site was contaminated by volatile organic compounds (VOCs), semivolatile organic compounds (SVOCs), and metals. During the site inspection, leachate seeps were observed.

In June 1988, the Himco site was proposed for the National Priorities List (NPL) and in February 1990, was officially placed on the NPL and designated a Superfund site. The site RI/FS was begun in 1989 and completed in 1992.

During the RI, a "hot spot" (an isolated area of highly concentrated contaminants) was identified at the southwest border of the landfill. See Figure 2. This area showed high levels of VOCS contamination. On May 22, 1992, U.S. EPA conducted an emergency removal action, which located and removed 71 55-gallon drums containing VOC's such as toluene and ethylbenzene. No other hot spots have been found at the site.

COMMUNITY PARTICIPATION

U.S. EPA issued a fact sheet to the public in July 1990, at the beginning of the RI. The Agency also held a public meeting on July 12, 1990, to provide background on the Himco Dump site, explain the Superfund process, and provide details of the upcoming investigation. U.S. EPA issued a second fact sheet in May 1992, to notify residents of the "hot spot" assessment and possible emergency removal action.

The FS and this Proposed Plan were both issued to the public on September 30, 1992. They are available to the public, along with other site-related documents, in the information repositories. To elicit public comments on the Proposed Plan and the other remedial alternatives evaluated in the FS, U.S. EPA is holding a 30-day public comment period and a public meeting. Detailed information on the public comment period and meeting follows this Proposed Plan.

SCOPE AND ROLE OF RESPONSE ACTION

The RI performed at Himco Dump was designed to characterize the nature and extent of contamination posed by hazardous materials at the site and to conduct a human health risk and ecological assessment. The RI sampled and analyzed groundwater, surface and subsurface soils, waste mass gas under the landfill cover, leachate collected from within the landfill, and surface water and sediments from the three ponds on the site (quarry pond, L-pond, and small pond). The data indicate the following:

* Principal threats at the site are posed by exposure to landfill leachate, landfill waste mass, and soil in the construction debris area.

* Landfill leachate is contaminated with VOCs, SVOCs, and inorganic contaminants.

* Soil in the construction debris area is contaminated with SVOCs and inorganics.

* The highest concentrations of arsenic and SVOCs were found in the construction debris area.

* VOC concentrations were found in low levels in surface water and sediment samples and low levels of SVOCs were detected in site surface water samples.

* Two rounds of groundwater sampling revealed limited groundwater contamination outside the boundaries of the landfill.

* Groundwater occurs in the study area at depths ranging from 8 to 17 feet below ground surface at an elevation ranging from 752 to 760 feet above Mean Sea Level.

* There is an unconfined aquifer below the Himco site consisting of a coarse sand and gravel.

* Groundwater flow is generally to the south-southeast towards the St. Joseph River, which is a regional groundwater discharge for this area.

A complete list of contaminants and sampling results can be found in the RI, which is available at the site information repositories. (See last page for repository locations.)

SUMMARY OF SITE RISKS

U.S. EPA conducted a baseline risk assessment using data from the RI to determine the magnitude of potential and/or actual risks to human health and the environment caused by the contaminants identified at the Himco site. This assessment is conducted to estimate the health or environmental problems that could result if the site is not remediated.

The risk assessment analyzes the toxicity, or degree of hazard, posed by substances related to the site, and describes the routes by which these substances could come into contact with humans and the environment. The baseline risk assessment is comprised of the human health evaluation and the environmental or ecological assessment.

HUMAN HEALTH EVALUATION

The carcinogenic (cancer) risk from an exposure to a chemical is described in terms of the probability that an individual exposed for a lifetime will develop cancer. This risk is stated in terms of "excess" cancer cases in a certain size population (one excess case in 10,000 people, for example). "Excess" means the number of cancer cases in addition to those that would ordinarily occur in a population of that size under natural conditions. The National Oil and Hazardous Substances Contingency Plan (NCP) established acceptable levels of risk for

Superfund sites ranging from one in 10,000 (1E-4) to one in 1 million (1E-6) excess cancer cases.

TABLE 1

CHEMICALS OF POTENTIAL CONCERN
HIMCO DUMP SUPERFUND SITE
ELKHART, INDIANA
1992

INORGANICS:

Aluminum
Antimony *
Arsenic *
Barium *
Beryllium *
Cadmium *
Chromium *
Cobalt
Iron
Lead *
Mercury *
Nickel
Silver
Thallium
Vanadium *
Cyanide *

ORGANICS:

VOLATILES

1,1-Dichloroethane
1,1-Dichloroethene *
1,1,1-Trichloroethane
1,2-Dichloroethene
2-Butanone
2-Hexanone
4-methyl-2-pentanone
Acetone
Benzene *
Bromodichloromethane *
Carbon disulfide
Chlorobenzene
Chloroethane
Chloroform *
Ethylbenzene
Methylene chloride *
Styrene *
Tetrachloroethene *
Toluene
Trichloroethene
Vinyl chloride *
Xylenes

SEMIVOLATILES

1,4-Dichlorobenzene *
2,4-Dimethylphenol
2-Methylnaphthalene
2-Methylphenol
4-Methylphenol
Acenaphthene
Acenaphthylene
Anthracene
Benzo(a)anthracene *
Benzo(a)pyrene *
benzo(b)fluoranthene
Benzo(k)fluoranthene *
Benzo(g,h,i)perylene
Benzoic Acid
Benzyl alcohol
bis(2-ethylhexyl)phthalate
Butylbenzylphthalate
Carbazole
Chrysene *
Dibenz(a,h)anthracene
Dibenzofuran
Diethylphthalate
Dimethylphthalate
Di-n-butylphthalate
Di-n-octylphthalate
Fluoranthene
Fluorene
Indeno(1,2,3-cd)pyrene *
Napthalene
Phenanthrene *
Phenol
Pyrene

PESTICIDES/PCBs

4,4'-DDT
4,4'-DDE
Aldrin
alpha-BHC
alpha-Chlordane
beta-BHC
Dieldrin *
Endosulfan II
gamma-Chlordane *
Heptachlor *
Polychlorinated biphenyls
(Aroclor 1248)

NON-CLP CHEMICALS:

Bromide, dissolved
Chloride
Nitrogen, ammonia
Nitrogen, nitrate & nitrite *
Phosphorus
Sulfate

* Contaminants posing unacceptable risks to hypothetical future residents south of the landfill

CLP - Contract laboratory program

Noncarcinogenic risks are measured by a Hazard Index. These risks are evaluated by comparing an estimated intake for a chemical over a specific time period (e.g., the amount of chemical ingested from contaminated drinking water) with a reference dose (RfD) for a similar exposure period. The sum of all chemicals and exposure routes produce the Hazard Index number. A Hazard Index of 1.0 or less means that there is no significant chance of adverse health effects from a site. A Hazard Index over 1 indicates the possibility of noncarcinogenic effects but does not mean that such an effect necessarily will occur.

The NCP requires that the risk assessment consider exposure scenarios both for current land use and for a conservative reasonable future use.

Contaminants of Concern and Exposure Scenarios

Eighty-seven chemicals detected in the site soil, groundwater, leachate, surface water or sediment were evaluated as to the potential for risk to both current and future populations. See Table 1.

No one currently resides or works on the site; however, certain other populations may be exposed to site contaminants. These include trespassers on the site who engage in recreational-type activities (dirt-bike riding, walking, playing, or fishing, etc.), people who reside next to the site (to the east, west, south, and southeast); and workers in nearby commercial and industrial enterprises (to the southeast). Potential routes of exposure for current populations, which were quantified in the risk assessment included: inhaling airborne particulates or volatiles released from the site (downwind residents and dirt-bike riders), ingesting soil while dirt-bike riding, ingesting surface water and sediment while wading or fishing and dermal contact with surface water while wading. With the exception of one drinking water well southwest of the site (Stoner residence across Highway 10), there is no current use of the aquifer in the vicinity of the site.

Future development of the site could be residential, commercial, agricultural or recreational. Pathways evaluated for future land uses included both soil pathways (ingestion and inhalation of volatiles or particulates) and groundwater pathways (ingestion, inhalation of volatiles released during indoor uses of groundwater and dermal). Future residents and workers were evaluated both on the landfill area and south of the landfill. Agricultural workers were evaluated on the landfill area only.

There appears to be no cause for concern for any current uses of the site. All carcinogenic risk estimates were below 1E-4 (one excess cancer per 10,000) and no hazard indices exceeded 1. These estimates place risks within an acceptable range as established by the NCP.

There is cause for concern for future uses of the site which involve use of the groundwater. If homes were built on the site in the future, use of the groundwater beneath the landfill could result in excess cancer risks in the range of 1E-1 (one in ten). For the same exposure pathways, hazard indices ranged from 500-1000. Chemicals contributing to these risks include arsenic, beryllium, cadmium, chromium, vanadium, alpha-chlordane, polycyclic aromatic hydrocarbons, and vinyl chloride. Additionally, lead is present in this leachate water at unacceptable levels. For the future worker (including the agricultural worker) risks were somewhat less, but still outside the acceptable range.

If homes or commercial establishments south of the landfill were to use groundwater in this area in the future, the estimated site-related risks associated with groundwater are within acceptable risk ranges. It appears that although the landfill leachate is contaminated at a level of health concern, this contamination has not impacted groundwater south of the landfill to a level of health and environmental concern. (The Stoner well was sampled in May 1992 and showed no contamination.) If a residence were placed in the area of SVOL contamination in the southeastern portion of the site, an estimated excess cancer risk of approximately 6E-4 was calculated for the soil ingestion pathway.

All other future land uses which do not involve use of groundwater do not appear to pose risk at a level of concern.

ENVIRONMENTAL EVALUATION

The Himco site has a large number of native plant species, probably due to nutrient-poor calcium sulfate and sand cover and efforts should be made to preserve them during site remediation. Site conditions are not likely to sustain wildlife species of concern (the Indiana bat, star-nosed mole, and badger). Although no surface streams drain the site, the St. Joseph River is located two miles to the south and contains a diverse fishery.

Contaminants in the soil where the prairie communities are located are not likely to have adverse effects on resident species of plants and animals. The greatest hazard occurs in the south/southeast area of the site where contamination is higher and more varied. However, this area is highly disturbed and unlikely to support ecologically significant populations.

A wetland investigation was conducted as part of the Himco site RI and this study indicated there is one wetland area located south of the quarry pond. Remedial Action construction techniques will be implemented to avoid or minimize adverse effects on the wetland.

REMEDIAL ACTION OBJECTIVES

The purpose of the remedy selection process is to implement remedies that eliminate, reduce, or control risks to human health and the environment. The objectives for remedial action are developed in terms of exposure routes and acceptable contaminant levels. They may be based on the baseline risk assessment and/or federal and state requirements.

The remedial action objectives for the Himco Dump site include:

Prevent direct contact with landfill contents and contaminated soils in the construction debris area.

Control groundwater usage in the vicinity of the site.

Minimize contaminant leaching to groundwater to ensure that groundwater remains unimpacted by the site contaminants.

Maintain the long-term cap integrity by incorporating a gas collection system and drainage control measures into the landfill body.

DESCRIPTION OF ALTERNATIVES

Four remedial action alternatives were carried through a detailed analysis in the Feasibility Study for the Himco Dump site. The No Action alternative (Alternative 1) serves as a baseline for comparison to other alternatives. Inclusion of the No Action alternative is mandated by the Superfund Amendment and Reauthorization Act (SARA).

COMMON ELEMENTS

Alternatives 2 through 4 have three general elements in common: Groundwater monitoring, institutional controls, and landfill gas collection and treatment.

Groundwater Monitoring
The RI data indicated that groundwater down gradient of the site has not been impacted to a level of health and environmental concern by the site contaminants. A groundwater monitoring program will be developed to evaluate if the remedy is effective in meeting the remedial action objectives. To ensure reliability of the data, additional monitoring wells will be installed at locations to be determined during development of the monitoring program, as part of the design phase. Samples will be analyzed for organic compounds and target metals.

Institutional Controls
Institutional controls are necessary to restrict access to the Himco site for present and future uses. Access restrictions include fencing the landfill and the construction debris area (on the south of the site) to limit unauthorized access (for recreational uses, for example), and deed restrictions to limit future building of residences or commercial enterprises on the site. Another type of institutional control is to place restrictions on pumping from the aquifer in the site vicinity to ensure that leachate from the landfill would not be drawn to the pumping well.

Landfill Gas Collection and Treatment
Landfill gas, including VOCs and gases produced naturally by the decomposition of organic materials in the landfill, will be collected by an active gas collection system and treated by using vapor phase carbon adsorption. The quantity and quality of landfill gas will be evaluated as part of the predesign investigations. At a minimum the system will need to treat off-gas for odor control. The treatment method of the off-gas is contingent on the quality of the landfill gas. Activated carbon used to capture the VOCs in the landfill gas could become characteristic waste when the carbon is spent. The spent carbon will be tested by the Toxicity Characteristic Leaching Procedure (TCLP) and managed accordingly.

ALTERNATIVE 1 - NO ACTION

The No Action alternative does not involve any remedial action at the site. The site would remain in its present condition and human health and environmental concerns would not be addressed. This alternative is included as a requirement by SARA to provide a baseline against which other alternatives may be compared.

Capital Cost: $0
Annual Operation and Maintenance Cost: $0

ALTERNATIVE 2 - SINGLE BARRIER, SOLID WASTE CAP; ACTIVE LANDFILL GAS COLLECTION AND TREATMENT; GROUNDWATER MONITORING; AND INSTITUTIONAL CONTROLS

Alternative 2 uses a single barrier, solid waste cap to contain the landfill waste mass and the contaminated soils in the construction debris area and soils in an area immediately south of the landfill, within the site boundary. The primary components of this alternative include:

Construct a single barrier, solid waste cap with a total area equal to approximately 58 acres. The cap will consist of an 18-inch vegetated soil layer, a 6-inch sand drainage layer, and a 2-foot, low permeability clay layer. The soil layer will be seeded, if possible, with the current on-site plant species to preserve the site's prairie plant community. Construction techniques for the cap will be implemented to avoid or minimize adverse effects on the wetland. The wetland will not be capped.

Install an active landfill gas collection system to remove gas generated in the landfill waste mass, and vent this gas to the atmosphere after treatment with vapor phase activated carbon to remove VOCs and control odor; and if necessary, construct a thermal oxidation process with a flare stack to destroy methane.

Establish a groundwater monitoring program to monitor the future groundwater condition and to evaluate if the remedy is effective in reducing the rate of leachate generation in the landfill, thereby minimizing the potential for adverse impacts to groundwater by site contaminants.

Implement institutional controls, including installation of a perimeter fence, deed restrictions limiting the site's future land use, and restrictions on groundwater use in the site vicinity.

Costs include groundwater monitoring for 30 years, a five-year review, and general maintenance of the cap's integrity.
Estimated Capital Cost: $7,539,000
Estimated Annual Operation and Maintenance (O&M) Cost: $210,000
Estimated Total Present Worth Cost: $10,429,000
Estimated Implementation Time Frame: 14 months

ALTERNATIVE 3 - SINGLE BARRIER, SOLID WASTE CAP; ACTIVE LANDFILL GAS COLLECTION AND TREATMENT; LEACHATE COLLECTION AND OFF-SITE TSDF DISPOSAL; GROUNDWATER MONITORING; AND INSTITUTIONAL CONTROLS

Alternative 3, uses the same elements as Alternative 2, but also includes a leachate collection system for the extraction of leachate in the landfill. The primary components of this alternative include:

Construct a single barrier, solid waste cap, as in Alternative 2.

Install an active landfill gas collection system, as in Alternative 2.

Install a leachate collection system consisting of approximately 680 vertical wells in the landfill to extract leachate generated in the landfill. The collection system will operate through leachate extraction wells placed in a grid pattern across the site. The collected leachate would be hauled off-site to a treatment, storage, and disposal facility (TSDF) for treatment and disposal. This would be a perpetual pumping and off-site treatment and disposal operation.

Establish a groundwater monitoring program, as in Alternative 2.

Implement institutional controls, as in Alternative 2.

Costs include groundwater monitoring for 30 years, and 24-hour daily operation of the leachate extraction system.
Estimated Capital Cost: $13,628,000
Estimated Annual Operation and Maintenance (O&M) Cost: $982,000
Estimated Total Present Worth Cost: $27,140,000
Estimated Implementation Time Frame: 21 months

<u>ALTERNATIVE 4 - COMPOSITE BARRIER, SOLID WASTE CAP; ACTIVE COLLECTION AND TREATMENT OF LANDFILL GAS; GROUNDWATER MONITORING; AND INSTITUTIONAL CONTROLS</u>

Alternative 4 is the same as Alternative 2, except that it uses a composite cap over the site. This cap provides a greater reduction in risk than Alternative 2 because the reduction of leachate generation is greater. As in Alternative 2 and 3, construction techniques for the cap will be implemented to avoid or minimize adverse effects on the wetland, which will not be capped. The primary components include:

Construct a composite barrier, solid waste cap with a total area equal to approximately 58 acres. The composite layer cap will consist of an 18-inch vegetated soil layer, a 6-inch drainage layer, a 40 mil high density polyethylene (HDPE) liner, and a 2-foot clay layer. As in Alternative 2, the soil layer will be seeded, if possible, with the current on-site plant species.

Install an active landfill gas collection system, as in Alternative 2.

Establish a groundwater monitoring program, as in Alternative 2.

Implement institutional controls, as in Alternative 2.

Costs include groundwater monitoring for 30 years, a five-year review, and general maintenance of the cap's integrity.
Estimated Capital Cost: $8,931,000
Estimated Annual Operation and Maintenance (O&M) Cost: $210,000
Estimated Total Present Worth Cost: $11,821,000
Estimated Implementation Time Frame: 15 months

U.S. EPA'S PROPOSED ALTERNATIVE

U.S. EPA is recommending Alternative 4 as the preferred alternative remedy.

Alternative 4: CONTAINMENT BY MEANS OF A COMPOSITE BARRIER, SOLID WASTE CAP; ACTIVE COLLECTION AND TREATMENT OF LANDFILL GAS; GROUNDWATER MONITORING; AND INSTITUTIONAL CONTROLS

This remedy will provide protection of human health and the environment by containing the landfill waste mass, the contaminated soils in the construction debris area and soils in an area immediately south of the landfill, within the site boundary. The composite cap provides a greater reduction in risk because it greatly reduces the rate of leachate generation in the landfill, minimizing potential for adverse impacts to groundwater by site contaminants. Construction techniques for the cap will be implemented to avoid or minimize adverse effects on the wetland.

Figure 3 shows a cross section of the cap and figure 4 illustrates the gas extraction system.

Alternative 4 would cost $8.9 million to construct and $2.1 million for operation and maintenance, reflecting a net worth of $11.8 million. It would take approximately 15 months to complete installation.

SUMMARY COMPARATIVE ANALYSIS OF ALTERNATIVES

EVALUATION CRITERIA

In order to determine the most appropriate alternative for the

FIGURE 3

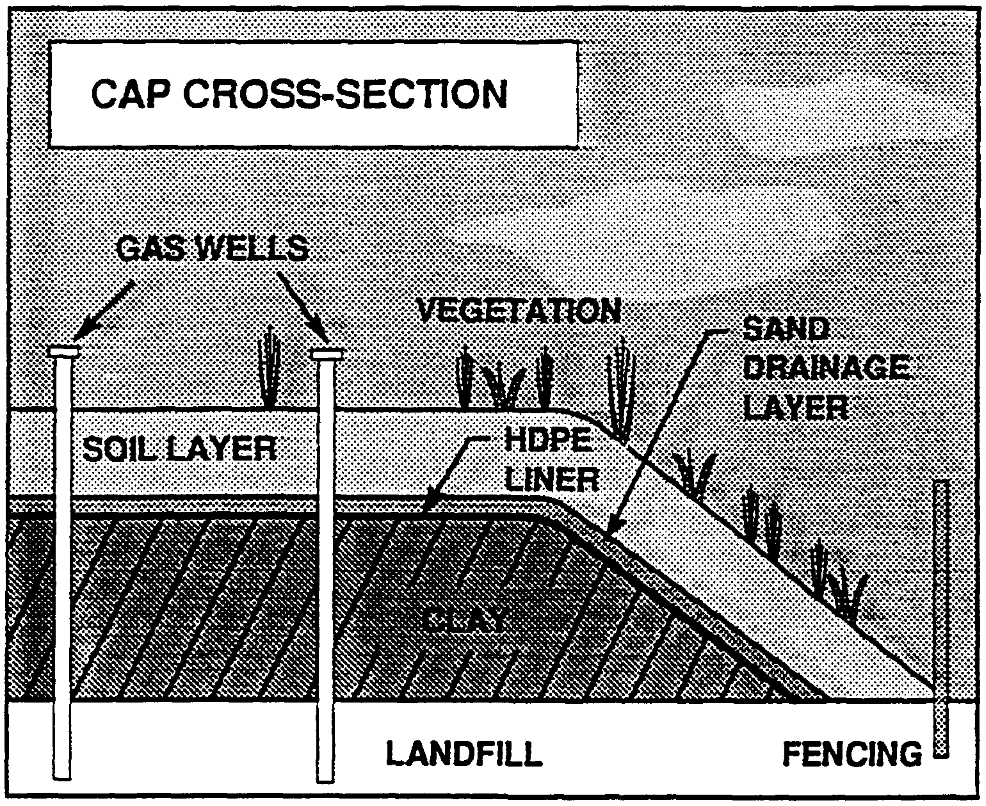
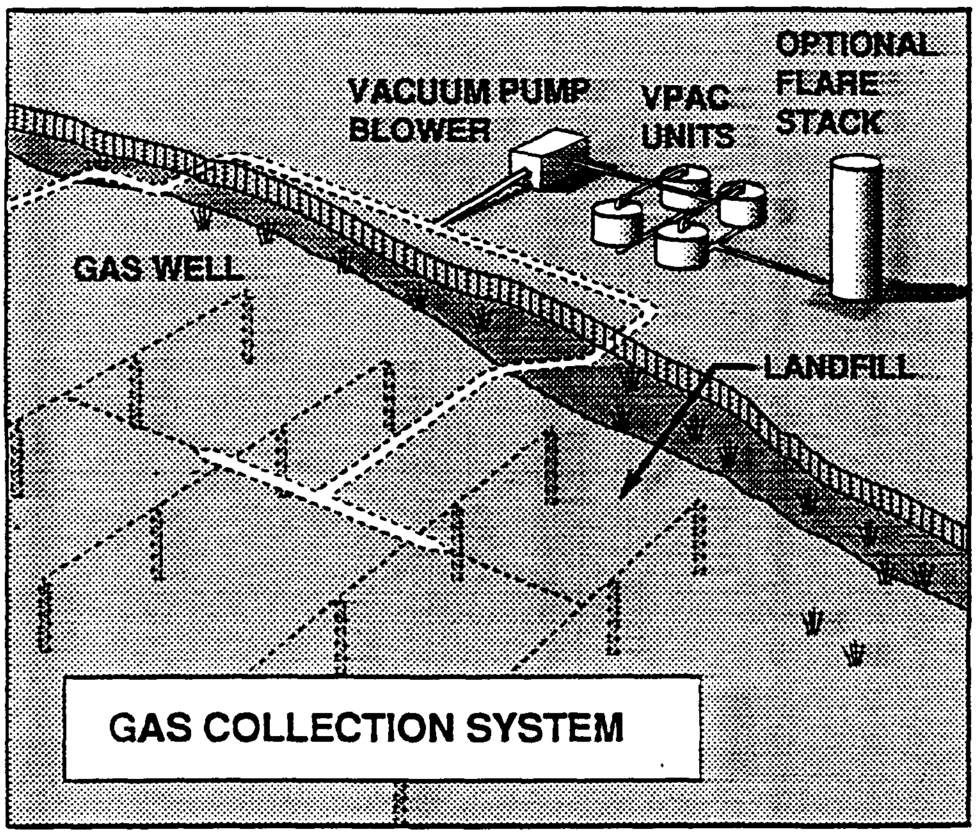


FIGURE 4



Himco Dump site, the alternatives were evaluated against each other. Comparisons were based on the nine evaluation criteria outlined below.

<u>Threshold Criteria:</u> alternatives must meet these criteria to remain in the evaluation.

1. **Overall Protection of Human Health and Environment** addresses whether a remedy provides adequate protection of human health and the environment and describes how risks posed through each exposure pathway are eliminated, reduced or controlled through treatment, engineering control or institutional controls.

2. **Compliance with Applicable or Relevant and Appropriate Requirements (ARARs)** addresses whether a remedy will meet all of the ARARs of other Federal and State environmental laws and/or justifies a waiver.

<u>Primary Balancing Criteria:</u> these five criteria weigh the positive and negative aspects of performance, implementability, and cost of each alternative.

3. **Long-term effectiveness and permanence** refers to expected residual risk and the ability of a remedy to maintain reliable protection of human health and the environment over time, once cleanup goals have been met.

4. **Reduction of contaminant toxicity, mobility, or volume through treatment** is the anticipated performance of the treatment technologies a remedy may employ.

5. **Short-term effectiveness** addresses the period of time needed to achieve protection and any adverse impacts on human health and the environment that may be posed during the construction and implementation period, until cleanup goals are achieved.

6. **Implementability** is the technical and administrative feasibility of a remedy, including the availability of materials and services needed to implement a particular option.

7. **Cost** includes estimated initial capital and operation and maintenance (O&M) costs. Cost is also expressed as present net worth cost, which is the total cost of an alternative in terms of today's dollars.

<u>Modifying Criteria:</u> reflect responses from the state and community and usually are not completed until after the public comment period is held.

8. **State/support agency acceptance** reflects aspects of the preferred alternative and other alternatives that the support agency favors or objects to, and any specific comments regarding State ARARs or the proposed use of waivers. The proposed plan should address the views known at the time the plan is issued, but it should not speculate. The assessment of State concerns may not be complete until after the public comment period on the FS and proposed plan is held.

9. **Community acceptance** summarizes the public's general response to the alternatives described in the proposed plan and FS based on public comments received. Like State acceptance, evaluations under this criterion usually will not be completed until after the public comment period is held.

The following section compares the performance of the four remedial alternatives against the nine criteria.

COMPARISON OF ALTERNATIVES

Overall Protection of Human Health and the Environment

Alternative 1, the No Action alternative, does not protect human health and the environment. Alternatives 2 and 3 provide protection by containing the landfill waste mass, the contaminated soils in the construction debris area and soils south of the landfill, within the site boundary, with a single barrier, solid waste cap and by collecting and treating the landfill gas. These alternatives in theory eliminate the human risk associated with exposure to landfill wastes and contaminated soil. They also reduce the potential environmental risk associated with release of the leachate into the groundwater or outside the landfill. In Alternative 4, the composite barrier cap provides an added level of protection by further minimizing infiltration into the landfill.

Alternative 3 provides greater risk reduction to the environment with the extraction and off-site treatment and disposal of leachate from the landfill. This action reduces the potential for leachate to be released into groundwater or other media outside the landfill boundaries.

Compliance with ARARs

All alternatives, except Alternative 1 (No Action), meet Federal and State ARARs; however, new regulations set forth in the October 9, 1991 Federal Register for solid waste landfills referring to leachate collections may be a potential ARAR. Although this ARAR may be relevant, it is not appropriate due to the uncertainty of the effectiveness of a leachate system and the technical impracticability from an engineering perspective.

Long-Term Effectiveness and Permanence

Alternative 1 (No Action) does not provide long-term effectiveness, since it would not change the current elevated risk levels at the site. Alternatives 2 and 3 provide long-term effectiveness and permanence by containing the landfill waste mass and the contaminated soils in the construction debris area with a single barrier, solid waste cap and by implementing institutional controls to maintain the cap's integrity and restrict site access and groundwater use in the site vicinity.

Alternative 4, like Alternatives 2 and 3, provides long-term effectiveness and permanence by containing the landfill waste mass and the contaminated soils in the construction debris area with a composite barrier, solid waste cap and by implementing institutional controls to maintain the cap's integrity, as well as to restrict site access and groundwater use in the site vicinity. The composite cap will greatly reduce infiltration into the landfill; thereby, minimizing the potential release of leachate into the groundwater and to the environment outside of the landfill boundaries. Alternative 3 has the added reduction of risk by adding the leachate collection system which will remove contaminated leachate from the landfill area. Because groundwater is hydraulically connected with the landfill waste, there is uncertainty as to the effectiveness of vertical leachate wells to collect the leachate. In addition, 680 extraction wells would need O&M and the system would require perpetual pumping, treatment and disposal.

For Alternatives 2, 3, and 4, potential environmental risk to the aquifer and other media outside the landfill boundaries are reduced by minimizing leachate generation in the landfill mass. Additionally, groundwater monitoring is included in Alternatives 2, 3, and 4 to monitor the aquifer condition to ensure the remedy is meeting remedial action objectives.

Reduction of Toxicity, Mobility, or Volume Through Treatment

Alternative 1, the No Action alternative, provides no reduction in toxicity, mobility, or volume of potential contaminants in the landfill mass. Alternatives 2 through 4 do not provide any reduction in toxicity or volume except for a slight reduction in VOCs through the landfill gas collection. Alternative 3 reduces toxicity and volume slightly more than Alternatives 2 and 4 by using a leachate collection system to collect and treat leachate from the landfill. Alternatives 2, 3, and 4 all reduce the mobility of contaminants by reducing leachate generation in the landfill.

Short-Term Effectiveness

All of the alternatives, with the exception of Alternative 1 require measures to minimize the short-term impacts on human health and the environment during construction and implementation phases, such as dust control and safe work practices. Issues related to worker protection are similar for Alternatives 2, 3, and 4. There are risks associated with workers' exposure to the landfill content during installation of leachate wells and gas wells. However, these risks can be controlled by following the appropriate health and safety requirements.

Implementability

Technically, all the alternatives are implementable and can be constructed readily with technology and materials presently available. Design requirements for the single barrier, solid waste cap in Alternatives 2 and 3 are slightly easier than the requirements for Alternative 4, which includes a geomembrane liner in the composite barrier, solid waste cap. Operation of Alternatives 2 and 4 is easier than for Alternative 3, which adds a leachate collection and storage system. The system would require the installation of approximately 680 extraction wells and periodic pumping and disposal of leachate at an off-site TSDF. In addition, construction, and operation and monitoring of the leachate collection system will be very difficult.

Cost

Because no action of any kind is involved in Alternative 1, this alternative has no cost.

The estimated capital costs (cost for construction and initial implementation) for the other three alternatives, from lowest to highest are: $7,539,000 for Alternative 2; $13,628,000 for Alternative 3 (the only alternative to include a leachate collection and treatment system); and $8,931,000 for Alternative 4. Annual operation and maintenance costs are the same for Alternatives 2 and 4 ($210,000) and are higher for Alternative 3 ($982,000). See Table 2.

In terms of present worth costs, Alternative 2 is lowest ($10,290,000), Alternative 4 is next lowest ($13,902,000), and Alternative 3 is highest ($27,001,000). The present worth cost provides a way of comparing the three alternatives on the basis of a single figure representing the amount of money that, if invested in a base year and disbursed as needed, would cover all costs associated with the alternative over its planned life.

Costs for each element involved in an alternative can vary over time and with different volumes of gas or leachate collected.

TABLE 2
COST SUMMARY
Himco Dump Superfund Site
Elkhart, Indiana

Alternatives	Capital Cost	Annual O&M Cost	Total Present Worth Cost*
1. No Action	$0	$0	$0
2. Single Barrier Cap, Gas Collection & Treatment, Groundwater Monitoring, & Institutional Control	$7,539,000	$210,000	$10,429,000
3. Single Barrier Cap, Gas Collection & Treatment, Leachate Collection System, Groundwater Monitoring, & Institutional Control	$13,628,000	$982,000	$27,140,000
4. Composite Barrier Cap, Gas Collection & Treatment, Groundwater Monitoring, & Institutional Control	$8,931,000	$210,000	$11,821,000

* Present worth cost based on interest(i)=6% and 30 years for O&M (see Tables 4-1 through 4-4).

State Acceptance

The State of Indiana supports the U.S. EPA's Proposed Remedy.

Community Acceptance

Community acceptance of the preferred alternative will be evaluated after the public comment period and will be described in the Record of Decision for the site.

The public is encouraged to comment on all alternatives evaluated in the FS and the U.S. EPA's preferred alternative. U.S. EPA will consider all significant public comments before making a final decision on the cleanup remedy. A summary of public comments and U.S. EPA's responses to them will be addressed in the Record of Decision for the Himco Dump site.

SUMMARY

Based on the information available at this time, U.S. EPA and the State of Indiana believe the preferred alternative, alternative 4, containment by means of a composite barrier solid waste cap; active collection and treatment of landfill gas; groundwater monitoring; and institutional controls, would be protective of human health and the environment, comply with ARARs, be cost effective and would utilize permanent solutions and alternative treatment technologies to the maximum extent practicable. This remedy, however does not satisfy the statutory preference for treatment of the threats at the site as a principal element because such treatment was not found to be practicable.

U.S. EPA believes that Alternative 4 provides the best balance of trade-offs among the four alternatives in terms of the nine criteria that U.S. EPA uses to evaluate cleanup alternatives. However, based on new information or public comments, U.S. EPA, in consultation with the State of Indiana, may later modify the preferred alternative or select another alternative presented in this Proposed Plan and the Feasibility Study. The public, therefore, is encouraged to review and comment on all four alternatives identified in this Proposed Plan. The RI/FS reports may be consulted for more information on the alternatives.

THE ROLE OF THE COMMUNITY IN THE SELECTION PROCESS

U.S. EPA solicits input from the community on the cleanup methods proposed for each Superfund response action. U.S. EPA has set a public comment period from September 30, 1992 through October 29, 1992 to encourage public participation in the selection process. The comment period includes a public meeting at which U.S. EPA will present the proposed plan, answer questions, and receive both oral and written comments.

The public meeting is scheduled for October 6, 1992 at 7:00 p. and will be held at the following location:

Council Chambers,
Municipal Building
229 South Second Street, 2nd Floor
Elkhart, IN 46516

Significant comments will be summarized and responses provided in the Responsiveness Summary section of the record of Decision (ROD). The ROD is the document that presents U.S. EPA's final selection for cleanup. The public can send written comments to or obtain further information from:

Dave Novak
Community Relations Coordinator
Office of Public Affairs (5PA-19J)
U.S. EPA Region 5
77 West Jackson Boulevard
Chicago, IL 60604

The proposed plan and the RI/FS Report have been placed in the Information Repositories and Administrative Record for the site. The Administrative Record includes all documents used in developing the remedial alternatives for the Himco Dump Site. These documents are available for public review and copying at the following locations:

U.S. EPA, Region V
77 West Jackson Boulevard
Chicago, Illinois 60604
Contact: Mary Elaine Gustafson, Remedial Project Manager

Elkhart Public Library
Reference Department
300 South Second Street
Elkhart, IN 46516

Pierre Moran Branch Library
2400 Benham Avenue
Elkhart, IN 46517

The following U.S. EPA and IDEM representatives may be contacted if you have further questions about the Himco Dump site:

Mary Elaine Gustafson
U.S. EPA, Region 5
77 West Jackson Boulevard
Chicago, Illinois 60604
(313) 886-6144

James R. Smith
Indiana Department
of Environmental Management
5500 West Bradbury Avenue
Indianapolis, Indiana 46241
(317) 243-5054

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APPENDIX F

SAMPLE LOCATION COORDINATES

PHASE I AND PHASE II REMEDIAL INVESTIGATION SAMPLE LOCATIONS
INDIANA STATE PLANE COORDINATES

HIMCO DUMP RI/FS
1992

SAMPLE ID	NORTHING (FT.)	EASTING (FT.)
SURFICIAL SOIL SAMPLES (PHASE I)		
HD-GS01-01	1,533,306	405,844
HD-GS02-01	1,533,003	406,094
HD-GS03-01	1,532,711	406,417
HD-GS04-01	1,532,406	406,294
HD-GS05-01	1,533,144	406,503
HD-GS06-01	1,532,806	406,800
HD-GS07-01	1,532,500	407,108
HD-GS08-01	1,532,500	407,408
HD-GS09-01	1,532,194	407,394
HD-GS10-01	1,532,183	407,500
HD-GS11-01	1,531,906	407,803
HD-GS12-01	1,531,689	407,700
LANDFILL CAP - GEOTECHNICAL (PHASE I AND II)		
HD-GE01-01	1,532,400	407,400
HD-GE02-01	1,533,300	405,800
HD-GE03-01	1,532,800	406,800
HD-GE04-01	1,532,400	406,700
HD-GE05-01	1,531,700	407,700
HD-GE06-01	1,532,400	406,700
HD-GE07-01	1,532,000	407,553
HD-GE08-01	1,532,385	407,490
HD-GE09-01	1,532,091	406,765
HD-GE10-01	1,532,600	406,523
HD-GE11-01	1,532,400	407,091

SAMPLE ID	NORTHING (FT.)	EASTING (FT.)
WETLAND SOIL (PHASE I AND II)		
HD-WS01-01, -02	1,533,317	405,289
HD-WS02-01, -02	1,533,083	405,494
HD-WS03-01, -02	1,533,222	405,797
HD-WS04-01, -02	1,533,022	405,761
HD-WS05-01, -02	1,532,608	405,842
HD-WS06-01	1,532,578	405,733
HD-WS07-01, -02	1,533,100	407,489
HD-WS08-01, -02	1,533,428	407,742
HD-WS09-01, -02	1,533,583	407,500
HD-WS10-01, -02	1,533,167	406,822
HD-WS11-01, -02	1,533,072	407,000
HD-WS12-01, -02	1,532,961	407,211
HD-WS13-01	1,531,894	406,622
HD-WS14-01	1,532,167	406,244
HD-WS15-01	1,531,906	406,844
HD-WS16-01	1,531,689	406,720
HD-WS17-01	1,532,895	407,763
HD-WS18-01	1,532,774	407,624
HD-WS19-01	1,532,800	407,766
HAND AUGER SOIL/MISCELLANEOUS SOIL (PHASE II)		
HD-HS01-01	1,532,932	405,327
HD-HS02-01	1,532,777	405,328
HD-HS03-01	1,532,927	407,467
HD-HS04-01	1,532,946	407,577
HD-HS05-01	1,532,972	407,728
HD-HS06-01	1,531,674	407,498
HD-HS07-01	1,531,928	407,125
HD-HS08-01	1,531,617	406,942
HD-HS09-01	1,532,062	406,558
HD-TL3DS1-01	1,531,801	406,837
HD-TL3DS2-01	1,531,801	406,837

SAMPLE ID	NORTHING (FT.)	EASTING (FT.)
SOIL BORINGS (PHASE I AND II)		
HD-GT01-01	1,531,613	407,617
HD-GT02-01	1,534,878	405,913
HD-GT03-01	1,532,539	405,533
HD-GT04-01	1,531,494	406,017
HD-GT05-01	1,531,172	407,106
HD-GT06-01	1,530,933	407,811
HD-GT07-01	1,531,550	407,647
HD-GT08-01	1,532,208	405,522
HD-GT09-01	1,533,869	405,956
HD-GT10-01	1,530,933	407,750
HD-GT11-01	1,531,906	406,361

SAMPLE ID	NORTHING (FT.)	EASTING (FT.)
MONITORING WELLS (PHASE I AND II)		
HD-WT101A	1,531,620	407,617
HD-WT101B	1,531,615	407,617
HD-WT101C	1,531,610	407,617
HD-WT102A	1,534,861	405,927
HD-WT102B	1,534,878	405,913
HD-WT102C	1,534,870	405,921
HD-WT103A	1,532,539	405,533
HD-WT104A	1,531,494	406,017
HD-WT105A	1,531,172	407,106
HD-WT106A	1,530,933	407,811
HD-WT111A	1,531,906	406,361
HD-WTB1	1,533,594	405,964
HD-WTB2	1,533,594	405,970
HD-WTB3	1,533,592	405,976
HD-WTB4	1,533,594	405,958
HD-WTCP1	1,533,411	405,739
HD-WTE2	1,531,556	407,125
HD-WTE3	1,531,560	407,125
HD-WTF1	OFF-SITE - NOT SURVEYED	
HD-WTF2	OFF-SITE - NOT SURVEYED	
HD-WTF3	OFF-SITE - NOT SURVEYED	
HD-WTG1	OFF-SITE - NOT SURVEYED	
HD-WTG3	OFF-SITE - NOT SURVEYED	
HD-WTI1	OFF-SITE - NOT SURVEYED	
HD-WTI2	OFF-SITE - NOT SURVEYED	
HD-WTI3	OFF-SITE - NOT SURVEYED	
HD-WTJ1	OFF-SITE - NOT SURVEYED	
HD-WTJ2	OFF-SITE - NOT SURVEYED	
HD-WTJ3	OFF-SITE - NOT SURVEYED	
HD-WTM1	1,531,883	407,097
HD-WTM2	1,531,882	407,097
HD-WTN1	OFF-SITE - NOT SURVEYED	
HD-WTO1	1,532,406	407,889
HD-WTP1	1,531,406	407,867
HD-WTQ1	OFF-SITE - NOT SURVEYED	

SAMPLE ID	NORTHING (FT.)	EASTING (FT.)
RESIDENTIAL WELLS (PHASE I)		
HD-RW01	1,532,086	405,989
HD-RW02	1,532,086	405,989
HD-RW03	1,531,847	405,228
HD-RW04	1,531,806	406,278
HD-RW05	1,531,806	406,278
HD-RW06	1,531,811	406,181
HD-RW07	1,531,853	406,089
HD-RW08	1,531,761	406,497
SURFACE WATER (PHASE I AND II)		
HD-SS01-01	1,533,000	405,383
HD-SS02-01	1,532,839	405,372
HD-SS03-01	1,532,628	405,342
HD-SS04-01	1,532,656	405,628
HD-SS05-01	1,532,744	405,658
HD-SS06-01	1,532,847	405,594
HD-SS07-01	1,532,950	405,603
HD-SS08-01	1,532,867	405,694
HD-SS09-01	1,533,544	407,289
HD-SS10-01	1,533,222	407,739
HD-SS11-01	1,532,975	407,233
HD-SS12-01	1,533,228	406,842
HD-SS13-01	1,532,709	405,375
HD-SS14-01	1,532,614	405,628
HD-SS15-01	1,532,909	405,631
HD-SS16-01	1,533,317	407,067
HD-SS17-01	1,533,364	407,348
HD-SS18-01	1,533,324	407,554
HD-SS19-01	OFF-SITE - NOT SURVEYED	
HD-SS20-01	OFF-SITE - NOT SURVEYED	
HD-SS21-01	OFF-SITE - NOT SURVEYED	

SAMPLE ID	NORTHING (FT.)	EASTING (FT.)
SEDIMENT (PHASE I AND II)		
HD-SD01-01	1,533,000	405,383
HD-SD02-01	1,532,839	405,372
HD-SD03-01	1,532,628	405,342
HD-SD04-01	1,532,656	405,628
HD-SD05-01	1,532,744	405,658
HD-SD06-01	1,532,847	405,594
HD-SD07-01	1,532,950	405,603
HD-SD08-01	1,532,867	405,694
HD-SD09-01	1,533,544	407,289
HD-SD10-01	1,533,222	407,739
HD-SD11-01	1,532,975	407,233
HD-SD12-01	1,533,228	406,842
HD-SD13-01	1,532,709	405,375
HD-SD14-01	1,532,614	405,628
HD-SD15-01	1,532,909	405,631
HD-SD16-01	1,533,317	407,067
HD-SD17-01	1,533,364	407,348
HD-SD18-01	1,533,324	407,554
HD-SD19-01	OFF-SITE - NOT SURVEYED	
HD-SD20-01	OFF-SITE - NOT SURVEYED	
HD-SD21-01	OFF-SITE - NOT SURVEYED	

SAMPLE ID	NORTHING (FT.)	EASTING (FT.)
WASTE MASS GAS (PHASE I)		
HD-TT01-01	1,532,000	407,300
HD-TT02-01	1,532,000	407,300
HD-TT03-01	1,532,000	407,300
HD-TT04-01	1,533,289	406,283
HD-TT05-01	1,533,150	406,500
HD-TT06-01	1,533,000	406,100
HD-TT07-01	1,532,800	406,800
HD-TT08-01	N/A (FIELD BLANK)	
HD-TT09-01	N/A (TRIP BLANK)	
HD-TT10-01	1,532,500	407,100
HD-TT11-01	1,532,500	407,400
HD-TT12-01	1,532,200	407,500
HD-TT13-01	1,532,200	407,400
HD-TT14-01	1,531,700	407,700
HD-TT15-01	1,531,900	407,800
HD-TT16-01	1,532,400	406,700
LEACHATE (PHASE II)		
HD-TL01-01	1,532,822	406,556
HD-TL02-01	1,532,203	406,650
HD-TL04-01	1,532,045	406,570
HD-TL05-01	1,532,223	406,254

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